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Do Cell Phones Cause Brain Cancer? The Diehards Cling Desperately To Opinion

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In some quarters the specter of cancer-causing cell phones refuses to be put to rest -- or even to be temporarily stilled while new studies are conducted.



(Image credit: Getty Images via @daylife)

In recent years a large number of studies from over a dozen countries have been published showing no evidence of a detectable link between cell phone use and brain tumors. This should be reassuring. Nevertheless, there are hard-core believers among activists and scientists who do not miss an opportunity to promote a contrary view.

Last October Italy's Supreme Court ruled that a business executive's brain tumor was linked to his heavy use of a mobile phone. In support of its judgment, the court cited studies by a single group in Sweden, which stand out from the totality of studies on the question.

And this past week, *The Scientist* carried a vehement opinion piece entitled “Scientific Peer Review in Crisis” attacking the *BMJ* (*British Medical Journal*) for publishing a large Danish study that found no association between cell phone use and cancer.

The author of the piece, Dariusz Leszczynski, is a research professor at the Radiation and Nuclear Safety Authority in Finland. He cited flaws in the design of the study that render any conclusions meaningless and asked whether the study passed peer review due to incompetence of the reviewers and editors or due to conflicts-of-interest among the former. He went on to call for retraction of the paper by the journal as well as for an investigation into how the paper passed peer review.

And in the penultimate sentence he alleged that the original study received funding from “a Danish phone company,” implying that the study’s failure to find an association between cell phone use and brain tumors was influenced by financial interests, although no such funding was declared in the published paper.

The Danish study is prospective in nature, which distinguishes it from most other studies on the **health** effects of cell phone use, which were case-control studies and enrolled subjects diagnosed with brain tumors and a comparison group of subjects who were free of brain tumors in order to compare reported cell phone usage in the two groups.

The Danish researchers enrolled all Danes 30 years or older and born after 1925 and divided them into those with cell phone subscriptions between 1987 and 1990 and those without. The cohort was followed from 1990 to 2007, and incidence of brain tumors was compared between subscribers and non-subscribers. In addition, the length of subscription was used to estimate years of cell phone use. No difference in the incidence of brain tumors was

found for having a subscription or for those with subscriptions of longer duration in men or women.

The strengths of the study include the fact that it made use of company records to identify cell phone users, thus avoiding the bias involved in asking subjects to recall their past use. Second, by including the entire eligible Danish population, which is covered by a national tumor registry, the study avoids the problem of selection bias (that is, people who do not make it into your study for various reasons, including refusal).

However, as noted by the authors themselves and the author of an editorial commenting on the article, the study has several limitations. First, having a cell phone subscription is not a guarantee of use, and some of those classified as non-subscribers may have been cell phone users. This type of misclassification of exposure could militate against detecting an association. Furthermore, no information was available on how many minutes per day a subscriber used the cell phone. Finally, only those with private subscriptions were included and this meant excluding 200,000 corporate users.

Like all epidemiologic studies, the Danish study is not perfect, but its strengths should also be acknowledged. Furthermore, it has been noted that misclassification of subjects would have been minimal for long-term users. Thus, one could expect the study to show some hint of an association with long-term use if one exists.

Leszczynski's logic is as follows: The Danish study found no association of cell phone use with brain tumors; however, the **International Agency for Research on Cancer** says that radiofrequency energy from cell phones is a "possible carcinogen." Therefore, the study must be wrong. Actually, IARC's conclusion was a concession to activists and proponents of the "precautionary

principle" (including the anomalous group from Sweden) rather than a **dispassionate assessment of the evidence**.

More telling than Leszczynski's criticisms is his stunning ability to ignore the totality of the evidence. The kind of certainty he expresses can only be explained by the combination of a strong belief and the conviction that the odd study that shows a hint of something going on must be right and the vast majority of studies that show no consistent effects must be flawed and biased. Cell phone die-hards all perform this same sleight-of-hand.

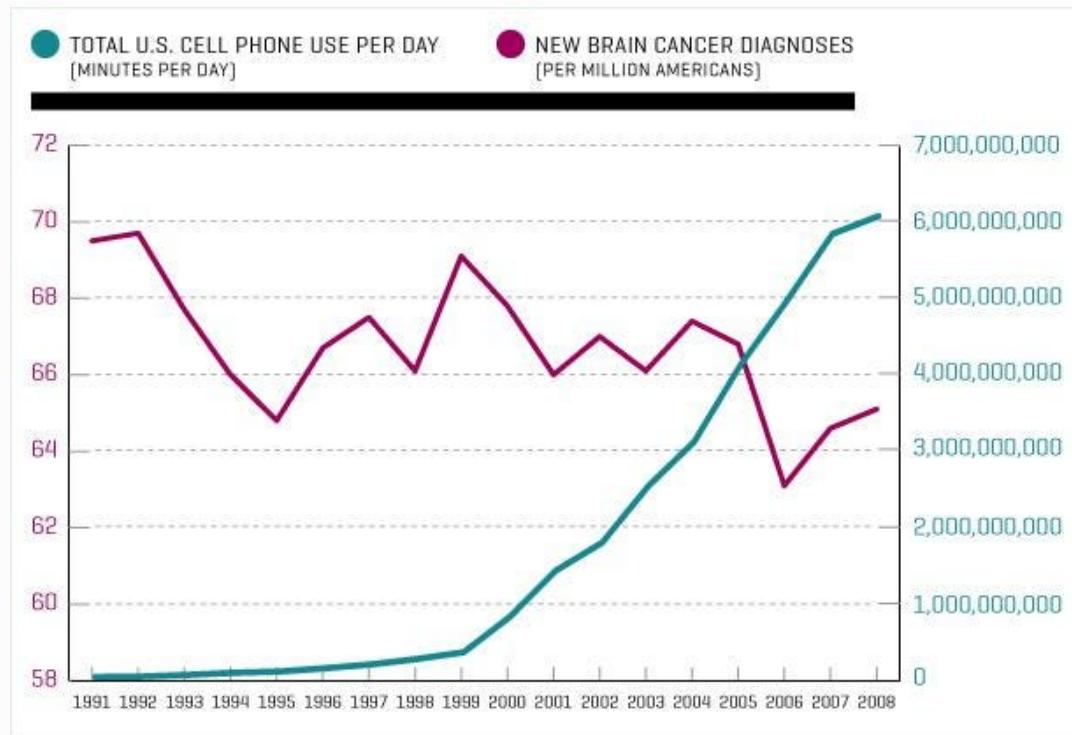
Of course, since cell phones have been in use for a relatively short time, we cannot rule out the possibility that heavy and long-term use may prove to have effects when more time has elapsed. A large new prospective study is being launched in Europe to address this possibility.

Nevertheless, balanced people should consider the substantial evidence of different types that has accumulated to date. This includes:

- a large body of epidemiologic studies, which, as evaluated by non-partisan organizations like the International Commission on Non-Ionizing Radiation Protection, fail to demonstrate any consistent or large association;
- extensive laboratory studies which, with few exceptions, provide no evidence that radiofrequency energy is tumorigenic;
- theoretical considerations, including the fact that radiofrequency energy is orders of magnitude weaker than the energy of the molecules in our body, making it rather implausible that it could affect cells.

- Finally, the past two decades have seen an explosive growth in cell phone use from 0 to 5 billion cell phone subscriptions. In spite of this, rates of brain tumors in advanced industrial countries show no evidence of an increase in specific types of brain tumors. This includes Scandinavian countries, which have country-wide tumor registries.

Consider the graph below, which shows that, in spite of the dramatic increase in the number of minutes per day of cell phone use in the U.S. since the late 1990s, the incidence of brain cancer has not increased and may have decreased slightly.



Credit: Scott Woolley, [Fortune, June 7, 2011](#)

Cell phone die-hards are convinced that radiofrequency energy from cell phones is having harmful effects on users and that the truth is being suppressed by a powerful alliance of the telecommunications industry, researchers, and governments. Scientists who try to describe the evidence in a dispassionate way

are routinely attacked for being corrupt and in the pay of industry. The believers portray themselves as having no conflicts-of-interest and motivated purely by their desire to avert a dire public health disaster. Interestingly, the movement includes many who still believe that the lower frequency radiation from power lines and electric appliances and motors also poses a cancer threat, in spite of the fact that 30 years of research has shown no effects.

It appears that nothing will shake the conviction of the believers. Their certainty rests on something much more visceral than what can be provided by any statistics and admittedly far-from-perfect studies.

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